

(14)**Improved Scattering Models for Guided Wave Tomography**

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Water collecting at pipe supports will accelerate corrosion, reducing the pipe life at a very difficult-to-inspect location. A traditional approach would require the pipe to be emptied, lifted and an ultrasonic thickness gauge be scanned across the surface. Guided wave tomography could potentially address these problems: by sending waves from an array on one side of the support through to a set of receivers on the other side, an image of the thickness can be produced, which is typically achieved by exploiting the dispersive nature of guided waves causing their speed to change depending on the thickness. However, this assumption results in a resolution limit of around 2 wavelengths (roughly 8 times wall thickness at a typical operating point), which is often too low for tomography to be a practical solution. To go beyond this, better models of guided wave scattering are needed. This talk will discuss approaches to address the limitations through more realistic scattering assumptions.